Quiz 3 Saved

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MATH 242L Calculus II

Name: Noah Yurasko

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Below, please find the most general antiderivative. Show all work for full credit. And remember that you can always check your final answer!

1. (1 point for answer, 3 for work shown)

$\int x \sin x \, dx$

$u = x$ $v = -\cos x$

$= uv - \int -\cos x \, dx$

$du = 1 \, dx$ $dv = \sin x$

$= uv + \sin x$

$= \boxed{-x\cos(x) + \sin(x) + C}$ Nicely done!

+4

2. (1 point for answer, 3 for work shown)

$\int x e^{(x^2)} \, dx$

$e^x \, dx = \int e^u \, du$

$u = x^2$

$du = 2x \, dx$

$u = x$ $v = e^{x^2}$

$d = 1 \, dx$ $dv = e^{x^2} \, dx$

$uv - \int e^{x^2} \cdot 1 \, dx$

$uv - e^{x^2}$

$\boxed{x e^{x^2} - e^{x^2} + C}$

This function has no elementary antiderivative. Alas!

try u-sub:

$u = x^2$.

+1

3. (1 point for answer, 3 for work shown)

$\int x e^{-x} \, dx$ $= uv - \int -e^{-x} \, dx$

$u = x$ $v = -e^{-x}$

$uv - e^{-x}$ ✓

$du = 1 \, dx$ $dv = e^{-x} \, dx$

$\boxed{-x e^{-x} - e^{-x} + C}$

Excellent!!

3. (1 point for answer, 3 for work shown)

$$\int x e^{-x}\,dx = uv - \int -e^{-x}\cdot 1\,dx$$

$$u = x \qquad v = -e^{-x} \qquad uv - e^{-x}$$

$$du = 1\,dx \qquad dv = e^{-x}\,dx \qquad \boxed{-xe^{-x} - e^{-x} + c}$$

Excellent!!